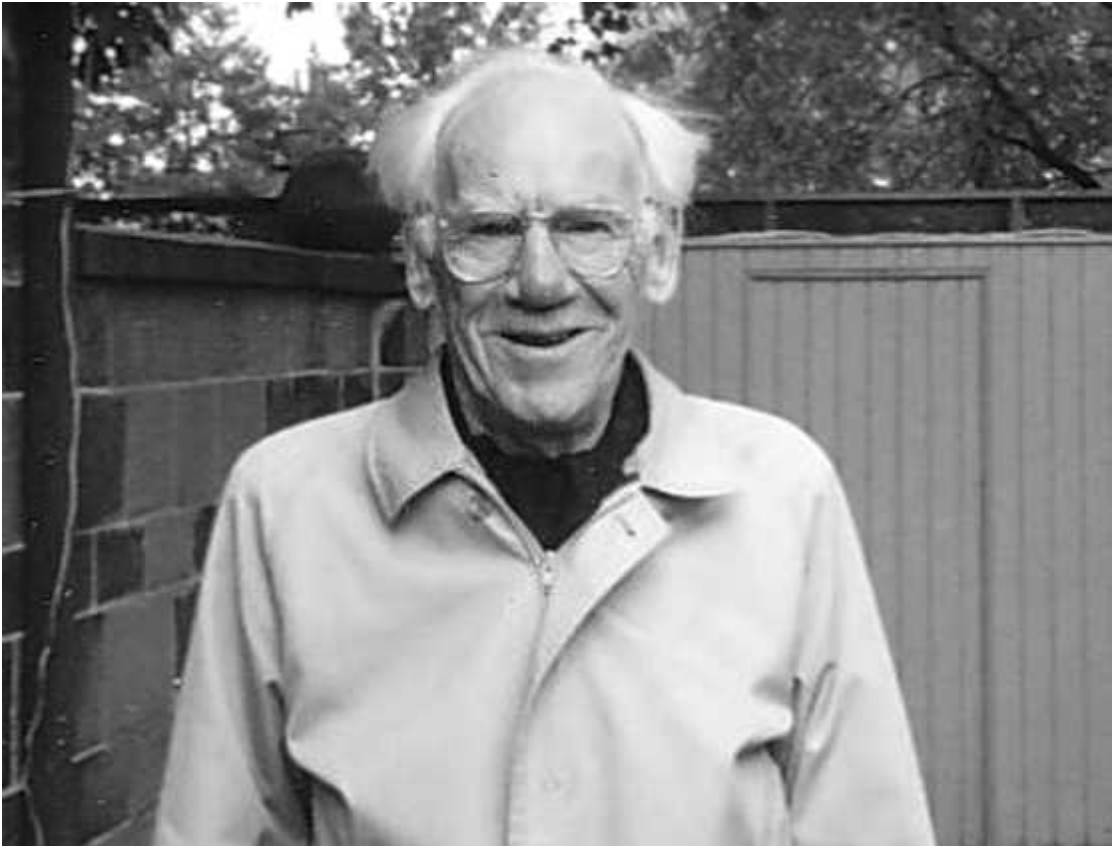


J. MICHAEL HARRISON (1915–2007): A RESEARCH CAREER WELL LIVED

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John Michael Harrison (Mike Harrison) was born in London, England on February 2, 1915 and died on November 30, 2007 at his home in Brookline, MA. He received his early education at Stonyhurst College and then graduated from the Institution of Electrical Engineering, London, in 1942. He then obtained a postgraduate academic diploma in psychology from University College and Birkbeck College, University of London, in 1947. At University College Mike did some of his graduate work with Cyril Burt.

Mike joined the faculty at Boston University in 1947 as an instructor and remained there for his entire academic career, advancing in rank to Professor of Psychology in the College of Arts and Sciences and Professor of Anatomy at the School of Medicine. Upon reaching mandatory retirement age at 65, Mike added Emeritus to his title and for 25 additional years continued his

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research at the university until shortly before his death. Mike loved laboratory work and he viewed retirement as an opportunity to focus on research without the distractions of other academic duties. To provide some perspective on a research career well lived, Mike published his first paper in 1946 and his last was published posthumously in 2008.

Mike's research career focused on audition, an interest that came naturally from his family history. Both Mike's father, G. Donald Harrison, and his stepfather, Henry Willis III, were famous organ builders. His father was at Aeolian-Skinner where, as tonal director and president, he established the "American Classic" design. Beautiful examples of his work include organs at Boston Symphony Hall and Yale University. His stepfather was at Henry Willis and Sons, Ltd. in England. As one would expect from both his phylogenetic and ontogenetic histories, Mike loved music.

The focus of Harrison's research was on both the behavioral and anatomical aspects of audition. His behavioral papers, including many in the *Journal of the Experimental Analysis of Behavior*, demonstrated the importance of ethological variables such as stimulus novelty, stimulus-response adjacency, and sound quality on the acquisition and maintenance of auditory stimulus control, and in doing so made substantial contributions in the field of behavior analysis (Beecher & Harrison, 1971; Burlile, Feldman, Craig, & Harrison, 1985; Downey & Harrison, 1972, 1975; Harrison, 1979, 1988, 1990; Harrison & Abelson, 1959; Harrison, Abelson, & Fisher, 1960; Harrison & Beecher, 1969; Harrison & Briggs, 1977; Harrison, Downey, Segal, & Howe, 1971; Harrison, Iversen, & Pratt, 1977; Harrison & Turnock, 1975; Neill & Harrison, 1987; Segal & Harrison, 1978).

He was an early advocate of the position that learning should be studied within an evolutionary context, long before the idea was widely accepted. Harrison argued that the design of animal learning and behavior experiments must incorporate the naturalistic features of the everyday environment of the animal if the results of the experiments were to be relevant outside of the laboratory. He often noted that the typical gradual learning curve presented in many studies as evidence of learning told one more about the lack of ecological features in the design of the experiment than it did about learning. If one designed the apparatus with the features of the natural environment in mind, acquisition curves were very steep and reached asymptote within a few trials. One common complaint frequently heard at his presentations was that Mike was not studying learning. Where was the learning curve? The idea that gradual acquisition of behavior in the natural environment was incompatible with fitness was not widely considered. Mike was never discouraged by his early lack of impact. Instead, he and his colleagues and students developed a humorous routine around the issue that kept him and his students going. A good summary of his work on stimulus control within an evolutionary context is provided by his 1992 paper in the *Journal of the Acoustical Society of America* (Harrison, 1992).

Mike's success was partly due to his insistence on specifying the stimulus exactly. This concern allowed him to detect unexpected sources of control. For example, in his studies of stimulus novelty, he showed that two or three unreinforced presentations of a stimulus would seriously retard its ability to control behavior when the stimulus subsequently predicted reinforcement. However, contrary to his view of the importance of novelty, Mike also noticed that occasionally even stimuli that were novel on the first trial would not quickly come to control behavior. Why not? Mike discovered that electrical artifacts in the 110-volt AC lines powering the apparatus would produce sounds from the speakers far above the range of human but not rat hearing. In other words, unknown to the experimenter during the baseline period when the speakers were off, the speakers were presenting sounds to the rat telling it that the programmed sounds from the speakers were irrelevant. Consequently, when one later intentionally presented sounds through the speakers, they failed to control responding. In order to isolate his experiments from AC artifacts, he conducted his experiments for a time using DC automobile batteries as a power source.

Mike was active in behavior analysis since its inception. He was a member of the Memorial Hall group at Harvard. He served as a member of the Board of Directors of the Society for the Experimental Analysis of Behavior (SEAB) from 1963 to 1966 and as Vice President of SEAB in 1966. He also served as an Associate Editor of *Journal of the Experimental Analysis of Behavior* from 1961 to 1967 and as a member of its editorial board from 1967 to 1969. He was a member of the editorial board of *Behaviorism* from 1972 to 1983.

In addition to his work in behavior analysis, Mike was recognized internationally for his work in comparative neuroanatomy with his students, Ron Abelson, Martin Feldman, George Fisher, Ron Irving, Bruce Warr, Margaret Howe, and Christopher West. In determining the functions of the brainstem auditory structures, Mike and his students contributed to a gradually evolving map of the auditory system in that region. This map shows cell types, cell counts, and types of synaptic endings, including the large bulbs of Held. It was among the first and probably the most comprehensive and has proved to be enduringly useful (Harrison & Feldman, 1970; Harrison & Howe, 1974; Harrison & Irving, 1964, 1966a, 1966b; Harrison & Warr, 1962; Harrison, Warr, & Irving, 1962; Harrison & West, 1967). On the basis of this work Mike and his students proposed what can be viewed as a duplexity theory of audition. They concluded that there are two distinct auditory pathways, recognizable as associated with the medial superior olive (MSO) and the lateral superior olive (LSO). Animals with only LSO present—dolphins, hedgehogs, and bats—have high frequency hearing. Those with MSO only—e.g., humans, chimpanzees—have low frequency hearing, and those with both LSO and MSO—rats, mice and cats—have both low and high frequency hearing (Feldman & Harrison, 1970; Harrison & Irving, 1966c; Irving & Harrison, 1967).

In another project looking at the detailed anatomy and projection of the nerve fibers forming the auditory nerve, Mike with Martin Feldman discovered an unexpected element, the acoustic nerve nucleus, a cluster of nerve cell bodies situated in the midst of the stream of the auditory nerve fibers on their way to the cochlear nuclei (Feldman & Harrison, 1969). This structure is clearly a significant element of the auditory system, but its unknown connections and function have perhaps led to its omission from all standard accounts of the auditory pathway.

In 2002, Mike's slides of the brain stem auditory system were donated to the National Museum of Health and Medicine, Armed Forces Institute of Pathology in Washington D.C. and are known as the Harrison Collection. This collection remains the most systematic cellular survey of the mammalian brainstem auditory system in existence.

During the last few years, Mike stopped his studies with animals and turned his attention to the psychophysics and perception of organ music. He recently published papers in the *Journal of the Acoustical Society of America* on the loudness constancy of pipe organ sounds at different locations in an auditorium (Harrison & Thompson-Allen, 1996, 1998a, 1998b). In 2000, the Acoustical Society of America appointed Mike to its Technical Committee on Musical Acoustics.

Mike spent virtually every day for more than 50 years in the laboratory. He insisted on running his own animals and collecting his own data. Although his experiments were automated, he carefully observed the behavior of each subject and took notes throughout each session. He worked in the laboratory alongside his students often through long nights and weekends. Because of this, he was greatly respected by his students and viewed by all who worked with him as the kind of scientist they would like to be. Of course, working alongside him allowed both his students and colleagues to understand just how talented a scientist Mike Harrison was. He never grew old or apart from his students. His dignified look and British accent notwithstanding, he was "Mike" to those who worked and studied with him.

In addition to his love of science and music, Mike was an avid sailor. He was one of the oldest members of the Boston Yacht Club in Marblehead, MA, and moored his beloved sloop "Quinte" in Marblehead Harbor. Occasionally during the summer he would leave the laboratory early for a day sail with a student or colleague. He would also sail "down east" to Maine each summer.

Those of us who knew Mike know he was a real character and we have many humorous stories of working with or traveling to meetings with Mike. Stories about trying to predict his dietary preferences are legendary and would fill a book. Suffice it to say that once during a meeting in Washington, D.C., it took several hours to find a restaurant that he would eat in.

Mike Harrison took great pride in resisting distractions such as deanships, chairmanships, directorships, and other academic honors, designed, in Mike's view, to prevent him from doing laboratory work. When I once asked him why he never left Boston University for greener pastures, he responded that he had the perfect job. He had a laboratory and a university that left him alone to do his research. For what more could a scientist ask?

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